# THE MAC Flyer

FEBRUARY 1984

How Could Anyone Survive?...page 4

# How Could Anyone Survive?

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*Editor's Note*— While we all hope that airline crashes will never occur—especially to us—it's a tragic fact that they do happen, occasionally. This article tells you how to improve your chances for survival if you ever have the misfortune to be involved in such a situation.

A multimillion dollar aircraft slams into the ground. A once-proud airliner is down. As you walk through the twisted wreckage, you wonder how anyone could have survived.

The aircraft wreckage shows signs of severe heat damage. Rivers of molten aluminum have solidified and wing spars, once strong enough to support the aircraft, now droop like toothpaste, a silent testimony to the heat of the fire. One person survives, but the person in the next seat doesn't. Why?

Investigation and analysis reveal much that's common to all crashes and to the survivors. What can you expect if you are involved in a crash? How can you be a survivor?

In the crash of a modern airliner, some particular kinds of structural damage frequently occur. The fuselage tends to rupture most often in these areas:

- Just behind the cockpit.
- Forward of the front wing spar.
- Behind the rear wing spar.
- At the tail section.

These breaks characteristically cut the fuselage into sections and often cause both the fuselage and the floor to warp. Seats can tear loose and the overhead storage bins can collapse. Emergency exits can be jammed by these distortions.

Extreme heat is often present, as well. The wings of today's airliners usually contain fuel tanks. If the wings rupture, thousands of gallons of volatile jet fuel can be spilled, and since there are many sources of ignition for this fuel, postcrash fire is common.

Where there's fire—there's smoke, and smoke and fumes from the airliner's interior are particularly deadly. The gases created by burning aircraft interiors are often highly

toxic and include carbon monoxide, hydrogen cyanide, hydrogen sulphide, hydrogen chloride, hydrogen floride and sulphur dioxide. The smoke generated by a post-crash fire can be so thick that it's impossible to see the person sitting next to you. When combined with the ruptured fuselage, fires can cause a "chimney effect," creating winds of 30 mph or more inside the cabin area.

The environment of the crash site can also create many hazards. Nature supplies snow, rain, strong winds and darkness, which, along with hills, forests, lakes or flatlands, create additional hazards for the survivors.

This then is the environment you could be faced with in the aftermath of a crash. But don't feel a crash is utterly 100 percent hopeless, because it isn't. Actually, you can do a great deal to improve your chances for survival.

### Will to Live

The first and most important component of survival is your own determination to survive. You must be prepared to rely on yourself and your own knowledge.

In several recent airline mishaps where passengers have died, the crew survived because they have been *trained* to open the exits in an emergency. They then direct passengers to the exit. When conditions threaten their own survival, though, crewmembers may be forced to abandon the aircraft. This could leave you still alive and still inside. So be prepared to get *yourself* out. Survivors' testimonies are full of phrases like "I planned my own escape," and "I knew I had to get myself out." What type of planning can you do? Well, the planning starts before you get to the airport.

### Dress To Survive.

This is an area where you can directly influence your ability to withstand heat and flames generated by an aircraft crash. Some general rules:

- Wear long sleeves and long pants to shield your skin from flames and heat.
- Wool offers the most protection.
- Polyester is the best synthetic fabric, and not all synthetics are bad.
- Light colored clothes reflect more radiant heat than dark.
- Multiple layers of clothes are better than a single layer.
- Loose weaves are more flammable than close weaves.
- "Fuzzy" fabrics are bad.
- Tight fitting clothing is dangerous because it allows direct heat transfer through the clothing to the skin.
- Very loose clothing is dangerous.
- High heeled shoes are dangerous.

But being properly dressed is only the first step in surviving an airline crash.

### Choose Your Seat Carefully

You can simplify your emergency egress if you sit next to an exit. That solves the problem of finding the exit in the smoke or darkness and reduces the distance to travel if you're injured. For example, I always ask to sit next to an overwing exit.

This can start as you enter the aircraft.

The doors you enter through have signs concerning emergency operation. Read them. Which way do the handles turn? Are they the same on both sides of the aircraft? (They may rotate in opposite directions.) How does the door operate? Does it push out, or does it pull in and turn? Be familiar with how to open the exits. There are many instances of crashes where passengers died at the emergency exits simply because they didn't know how to open them. Don't be one of those victims.

**Listen to the Briefing**

The emergency briefing will be given by the flight attendants. Listen to it. Identify *all* of the exits because the one nearest you may not be usable. If there are people between you and the exits, observe them for potential hazards. Are there obese people who may block the exit? Is the person near the exit strong and healthy looking? The overwing exit doors weigh over 60 pounds; could they lift that weight? Exit doors may jam and need to be forced open; is the person strong enough to do that? These and other factors should influence your planned exit route and your plans to assist others during an emergency egress.

**Ditching Procedures**

Who listens to this briefing unless you are flying over the ocean? *You* should! Have you ever noticed how much water is around many airports? Combine this with the fact that the majority of accidents occur during takeoff or landing and you could face a ditching situation. You should *know* what to do.

**The Brace Position**

This position is generally shown on the emergency information cards found in the seatbacks. One aspect of this position which is not adequately covered, though, is the position of your legs. They should be out in front of you—not tucked under your seat. This will prevent them from swinging forward in a crash and hitting the seat in front of you. You don't want broken legs if you need to escape from the aircraft. (Feel the seat bottom in front of you next time you fly. It consists of a metal bar covered by cloth. This bar has broken the legs of passengers during crashes.)

**Plan an Exit Route**

You must be prepared to egress without being able to see where you're going. Count the number of rows of seats to the exits nearest to you. Now it's possible to *feel* your way to an exit. When you arrive at the exit, though, you aren't safe yet. How do the slides work? Do you go off the back of the wing or off the front? (It's often better to slide off the back of the wing because it's usually closer to the ground.) Whatever happens, sit down and slide off—don't jump. It's a long way to the ground from a wing. Don't break a leg now.

**Don't Breathe Fumes**

The toxic gases given off as products of combustion can be partially filtered. The best available filter may be a water soaked cloth held over your nose and mouth. A dry cloth is better than no filter at all. Take shallow breaths and as few as possible. Hold your breath if you can, at least until you're clear of the smoke and fumes.

**Exit the Airliner When It Stops**

The faster you leave the aircraft, the greater your chances of avoiding toxic fumes, heat and other hazards. You must plan to exit the aircraft on your own. If you're injured, don't wait for help. Help yourself. If the crew and other survivors are able to help you, that's a bonus, but don't count on them. They may be incapacitated or otherwise occupied.

If you're traveling with your family, you have added responsibilities. Make sure that *they too* know how to survive. Discuss your plans with them. If you must evacuate through smoke, have them hold on to you and each other. Their hand on your belt can provide a secure lifeline. Your problems will be different if you have small children. Think about what you'll have to do for them.

This list of considerations is intended only as a guide. There are other obstacles not addressed here which will be created by the varying dynamics of each individual crash.

If you've thought about these topics, though, you'll have a basis on which to plan your survival. If you're prepared, you may become the survivor who helps others to safety.

# Flying-Hour Milestones

## 5,000

Col John E. Polk, HQ MAC/IGI
Col William E. Takacs, 20 SOS
Lt Col Kenneth L. Ernest, 20 SOS
Lt Col William Gericke, 16 SOS
Lt Col James L. Hobson, Jr., 8 SOS
Lt Col Donald James, 8 SOS
Lt Col George Shipp, 16 SOS
Lt Col Roland Wurstner, 16 SOS
Maj Lee Clark, 16 SOS
Maj Alban Collette, 16 SOS
Maj Michael Couvillon, 16 SOS
Maj Russel B. G. Darden, 8 SOS
Maj Gerald P. J. Democko, 8 SOS
Maj David F. Deterich, 8 SOS
Maj Marion A. Dykes, Jr., 8 SOS
Maj Carl Houston, 16 SOS
Maj Ernest Johnson, 16 SOS
Maj Douglas McGarity, 16 SOS
Maj Robert L. Meller, 8 SOS
Maj John Thomas, 16 SOS
Maj Clement Twiford, 16 SOS
1st Lt James H. Walters, 20 SOS
CMSgt Donald Beardsley, 16 SOS
CMSgt Willard Dunn, 16 SOS
CMSgt Sherman Eller, 16 SOS
CMSgt Louis R. Jacques, 8 SOS
SMSgt Ray C. Doyle, 8 SOS
SMSgt Jerry W. Garrett, 8 SOS
SMSgt Fredrick C. Hess, 8 SOS
MSgt Mitch Brown, 16 SOS
MSgt Rodger Capps, 16 SOS
MSgt James D. Chesser, 8 SOS
MSgt Dwight A. Newberry, 8 SOS
MSgt Donald Wilson, 16 SOS
TSgt Wesley B. Witherspoon, Jr., 8 SOS

## 2,500

Lt Col Wayne D. Corder, 20 SOS
Lt Col Louis W. Grant, 20 SOS
Maj James R. Blewitt, 20 SOS
Maj Terry C. Huey, Det 4, 40 ARRS
Maj Horace E. Johnson, 20 SOS
Maj Donald E. Nieto, 20 SOS
Flt Lt William D. Thompson, Det 4, 40 ARRS
Capt Michael C. Damron, 20 SOS
Capt Michael J. Russell, 20 SOS
Capt Michael W. Skeen, 20 SOS
1st Lt John F. Kelly, 20 SOS
CMSgt Floyd W. Watson, Jr., 20 SOS
MSgt Larry P. Gasbarri, 20 SOS
MSgt Robert W. Hall, 20 SOS
MSgt Milas L. King, 20 SOS
MSgt Stephen C. Morrow, 20 SOS
MSgt John D. Selfridge, 20 SOS
MSgt Richard L. Simmon, 20 SOS
MSgt Irving J. Stiffler, 20 SOS
MSgt Andrew Straughn, Jr., 20 SOS
MSgt Larry R. Tomb, 20 SOS
TSgt Richard G. Dolby, 20 SOS
TSgt Steven W. Johnson, 1551 FTS
TSgt Richard G. Pinkowski, 20 SOS

Ranks and units are those at time of award. See MACR 900-3 for details on how to apply for your own milestone award.

# Flying Circus

### Marshaller Mishap

Here are the words of a commercial airline ground marshaller who very nearly met the ultimate fate thanks to a "failure to follow procedure." The only reason this is in "Flying Circus" is because the marshaller is still with us.

"The plane was fueled and ready to go. I was on headset and requested 'brakes off, beacons on.' The push-back complete, I told the captain to park his brakes, which he did. I then disconnected the tow bar and flagged the tractor driver away. Following normal procedures, I got under the plane and began reconnecting the torque link. By this time, the captain had two engines started, was ready to taxi, and notified me of this. But I was still busy connecting the link, so I didn't acknowledge his transmission.

"The moment I finished connecting the torque link and while I was still under the plane, I heard the rpm of the engines rise and felt the plane begin to taxi. I quickly jerked my foot out of the way of the nosewheel, snatched the cord out of the jack box and ran from beneath the plane, the main wheels coming close to running over me. The electrical power door was still open with the wands inside it, but the crew continued taxiing toward the runway.

"I—nervous, upset and very nearly frightened to death—quickly got back to the gate, jumped into a vehicle and went after the aircraft. I caught them before they got to the runway and completed the rest of the procedure.

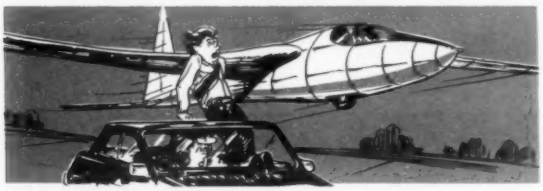
"The captain was apologetic and, luckily, I was none the worse for the wear!"

### Dump That Trash

Most of us in MAC have been called, and often take pride in being called, "trash haulers." Well, hauling it is one thing, but dumping it on the unsuspecting folks below during practice airdrops is quite another!

This particular stalwart, steely-eyed Herk crew had the ramp and door open in preparation for yet another practice aerial delivery mission. As the loadmaster was standing on the ramp watching things happen, the trash bin, located on the side of the cargo compartment, broke loose, rolled down the cargo compartment and out of the plane, narrowly missing the loadmaster in the process. The loadmaster continued to watch the bin do a free-fall act, the act ending in the middle of a lake.

Turns out the latch pin holding the bin in place either vibrated loose in flight, or failed altogether. Trash hauler, si! Trash dumper, no!



### Look Ma, No Hands

We find a glider pilot attempting to bring his motorless craft in for a "safe" landing. But as the non-powered aviator peruses the intended runway, an automobile starts driving around the airfield. He continues:

"He was sitting on top of his sunroof-equipped car, steering with his feet. His young daughter was operating the gas pedal. He was driving erratically, swerving from side to side. I was on base at the time. As I turned final, the car and driver turned onto the runway and drove in my direction at about 25-30 miles per hour. I had to close my speed brakes and zoom over the car, landing beyond same at the far end of the runway."

Good thing the daughter didn't accidentally hit the brake!

—FAA *Western Intercom*

### Flying Jacket

Folks, there are hazards we never dreamed of associated with those few airplanes still around which have open cockpits. That term also goes for aircraft which still fly around with their cockpit doors open, too. Take the ubiquitous Huey, for instance.

The young lieutenant copilot was happily flying along with his brand new, semi-expensive nomex jacket leisurely draped over the back of his seat. I might also add, *improperly* and leisurely draped on the back of his seat. Anyway, you guessed it. A gust of wind entered the open door of the UH-1 catching the jacket and propelling it out the door. Cost of the jacket was $101.00. Cost to the young lieutenant's ego was not mentioned.

### Stowaway

This one falls under the heading of "you'll-never-know-what-you're-going-to-find-next" department, and is also a good reason to have a sense of humor when you're a loadmaster.

This particular loadmaster had just finished loading a baggage pallet onto his Starlifter. Noting some unusual noise coming from the innards of the pallet, he called in some reinforcements and together, they started delving into the pallet in an attempt to find the source of the weird sounds. They zeroed in on a footlocker belonging to one of the passengers who was homeward bound on emergency leave. Opening the checked baggage, imagine their amazement when they found a young lady from their host country! The stowaway and her apparent "sponsor" were detained for questioning by the proper authorities.

### First For FOD

Just as the pilot of the non-US fighter gave the "pull chocks" signal, the young airman marshaller spotted some fluid on the nose-wheel steering unit. The marshaller gave the pilot the "hold" signal, and the conscientious airman headed over to take a closer look at the nosewheel steering unit. As the airman passed forward and below the engine intake, the engine began to vibrate and compressor stall. The pilot immediately shut down the errant engine and egressed uneventfully.

Well, the cause of the engine vibrations was some FOD which the engine ate with a voracious appetite. The FOD turned out to be a wig the airman was wearing—until the aircraft inadvertently entered barber school, that is.

—RAF *Ostrich*

# The Global Positioning

**Its like having a VORTAC everywhere, even in the middle of the ocean!**

For most of man's existence, navigation has been an art passed from father to son. Eventually navigation became a science when man started to plot the stars in the heavens. Even today, navigators still practice celestial navigation.

The invention of the wireless radio freed man, at least a little, from his dependence on the stars for precise navigation. Intercontinental and transoceanic crossings today combine radio aids, like VLF/Omega and Loran-C, VORTACs, and celestial navigation. Coupled with INS, the combination of nav systems provides fairly reliable information. Lest we forget Korean Air Lines 007, though, these nav systems are only as good as those who program and use them.

Today, however, we are on the verge of a space-based radio navigation system which can guarantee 100 percent coverage of the earth, 24 hours a day, with accuracies only dreamed of before. Navstar is just around the corner.

**History**

Prior to 1973, the Navy and Air Force were working on separate, service-unique satellite nav systems. In December 1973, the Defense Systems Acquisition Review Council directed the services to work together on a single satellite-based nav system which civilians could also use. The result became known as the Global Positioning System (GPS), or Navstar. A Joint Program Office (JPO) is managing GPS development at Los Angeles AFS. Included in this team are people from the armed services, Department of Transportation (DOT), NATO, Australia, and the Defense Mapping Agency.

After that 1973 decision, the JPO started a three-phase program which will eventually lead to full operational capability by 1988-89. Under Phase I, four contractors developed and demonstrated user equipment (UE) sets which validated the GPS concept. Following this competition, Rockwell-Collins and Magnavox were then selected for Phase II, or full scale development, to refine the UE sets and further demonstrate GPS capability. This phase is still going on and should be completed within the next 2 to 3 years. Full-scale production of UE sets will occur during Phase III. Integration of UE sets into military host vehicles will begin in 1985 and continue through the 1990s. Complete system capability will be achieved in 1988-89 when the entire 18-satellite constellation (plus three on-station, operational spare Navstars) will become operational.

**What It Is**

GPS was developed to provide precise position, velocity and time information to those who use it. How precise? Very precise! Navstar will provide accuracy down to 15 meters spherical error of probability, a velocity accuracy of 0.1 meters per second, and timing as close as 100 nanoseconds!

For at least the foreseeable future, the users of GPS will be the DOD, DOT, and U.S. Coast Guard. Eventually, the government will allow civilians use of the system.

**Components**

The heart and soul of the system is the satellite-based radio transmitter. Actually, there are 18 satellites in this man-made constellation located in six orbital planes. The orbits are approximately 10,900 nautical miles (20,200 kilometers) high with three satellites in each plane. With this kind of coverage, a user will have at least four (and as many as seven) satellites within range of his or her position at any given time, four being the minimum number necessary to solve the three-dimensional positioning problem.

Each satellite will transmit on two L-band frequencies of 1575.42 MHz. (L1), and 1227.6 MHz. (L2). L1 will carry the precise (P) signal and a coarse acquisition (C/A) signal. L2 will carry either a P or a C/A signal.

# System

by Capt. Byron L. Howard
Associate Editor

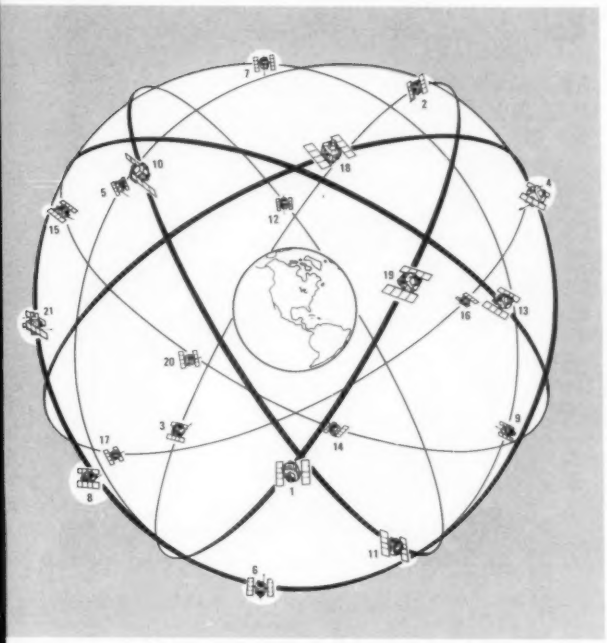


**Figure 1: The Navstar Operational Constellation will have 18 satellites plus 3 active spares.**

Imposed on these signals will be navigation and system data including satellite ephemeris (basically where the satellite is), atmospheric propogation data and satellite clock bias information.

The second element of the four-element GPS system consists of the ground-based monitor stations and ground antennas located around the world. The monitor stations will passively track all the GPS satellites and process the data received from them. That data will then be processed by a master control station to determine satellite orbits, and to update the navigation message of each satellite.

Another element of GPS is the user equipment set. Because each user's requirement is unique, the UE sets were designed with a particular user in mind. By building each UE set in modules, though, a high degree commonality was achieved which lowered cost and maintenance.

All UE sets fit into one of three categories depending on the type of mission, vehicle, unique requirements of that mission, etc. Those of us in MAC, for instance, will operate medium dynamic sets in our aircraft. Like the term indicates, we fly in a medium dynamic and/or medium jamming environment. Medium dynamic sets sequentially track and monitor two satellites on each of their two channels (four satellites total). Low dynamic sets are designed for ground troops and their associated vehicles, like tanks and jeeps. High dynamic sets will be found in strategic bombers, fighters and the like.

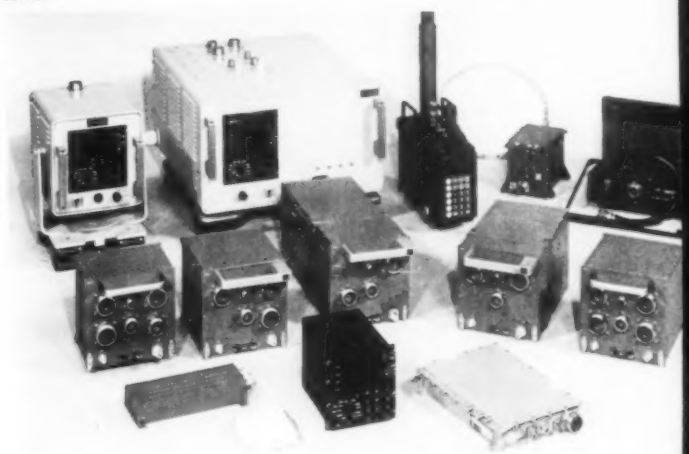


**Figure 2: User Equipment representing land, sea and air operations.**

The final element of Navstar is the NUDET, or nuclear detonation detection package, found on all Block II Navstar satellites. Designed to enforce the provisions of the SALT agreements, NUDET will transmit on a third frequency, 1381 MHz. The first NUDET package (Block II satellite), was launched on 14 July 1983. With that launch (Navstar 8), there are now seven satellites in orbit.

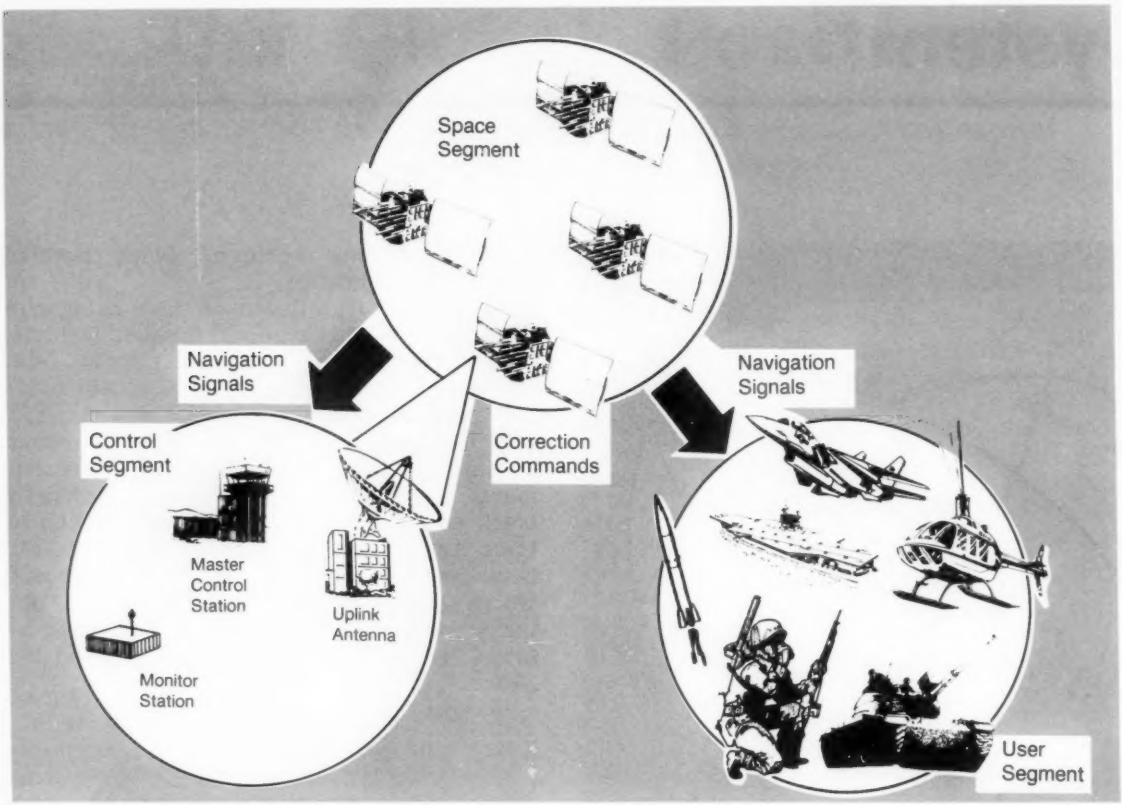



**Figure 3: GPS system operation.**

### Survivability

GPS is a survivable system with counter-threat features designed into the entire system from the beginning. For instance, although the satellite portion of the system is still relatively safe, the satellites will have passive measures to protect them from anti-satellite, laser-derived and particle-beam weapons. These measures include the high-altitude orbit, limited hardening and "graceful degradation" (gradual decrease of signals and signal accuracy) of the satellite constellation.

The main threats to the monitor station are direct attack, sabotage and the ever-present jamming/spoofing. To prevent the latter, encrypted telemetry and command links ensure the satellite's signals are reliable and accurate. To counter any direct attack or sabotage, there will be security measures around each station. But knocking out one station will have little effect on the entire system since there will be a number of stations and antennas located around the world.

Since the possibility exists for non-authorized use of the system during a contingency, selective availability features will permit authorized users to navigate with full accuracy while non-authorized users will experience degraded performance.

### Military Applications

Because the GPS uses a common grid, the World Geodetic System of 1972 (WGS 72), civil and military position data can be standardized on a worldwide basis. The UE sets will be capable of converting WGS 72 into other commonly used datums when operating with other map products.

For military air operations, there isn't one mission that can't be enhanced by GPS. For MAC specifically, we'll use GPS from takeoff until landing. Departures, accurate and precise enroute navigation, DZ/EZ/LZ acquisition, all-weather airdrop, air refueling ren-

dezvous, search and rescue, mine laying and terminal approach and recovery will all be enhanced substantially. (In this context of enhancing existing systems, don't look for GPS to completely replace any existing nav system. Rather look for Navstar to work *with* INS, Doppler, and Omega to produce a synergistic effect.)

### Civil Uses

With the recent tragedy of KAL 007 still fresh on our minds, the immediate use of GPS for civil carriers will emphasize oceanic navigation on those routes where aircraft are out of range of air traffic control radars and other ground-based aids. But there will also be other benefits from the civilian use of GPS. Optimal course navigation will reduce fuel costs, and enhance search and rescue efforts. GPS may even be used in a collision avoidance system and a maritime hazard reporting system.

Other possible uses for this versatile navigation system still being explored concern spacecraft navigation during flight, reentry and landing. Finally, in the never-ending search for new caches of minerals, GPS will give us the capability to precisely locate ore bodies, potential petroleum bearing areas and active fault belts quicker than before.

### Conclusion

GPS is a system whose time has come. Once the entire 18-satellite constellation is in operation, accurate and reliable navigation information will be available at the touch of a finger. Coupled with current inertial nav units, the GPS increases our ability to go anywhere in the world with precision and reliability previously unheard of, while increasing operational effectiveness and safety at the same time. In short, it's like having a VORTAC anywhere in the world, even in the middle of the ocean!

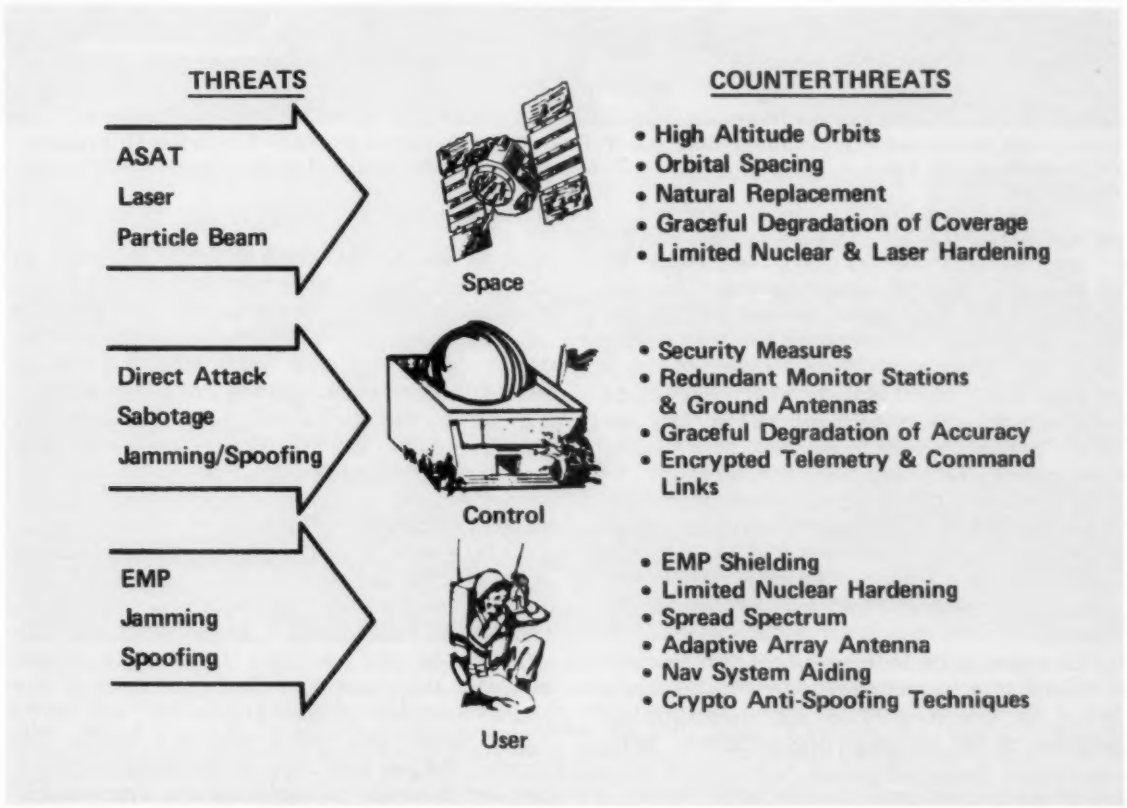



**Figure 4: GPS survivability.**

# *Advanced Investigator Courses*

## A look at MAC's "graduate level" safety courses.

Seated clockwise from left: Colonels Sherman W. Bear; Gene H. Davis; Richard B. Fowler, II; James C. McComb; Robert L. Paul; William M. Rodgers; Baxter F. Snider; William E. Takacs; Charles G. Thomas; Jon P. Woods.

The state-of-the-art in the field of aircraft mishap investigation changes constantly and new investigative techniques point to better investigations. To ensure continued high-quality mishap investigations, the HQ MAC flight safety staff developed two programs now recognized as the first Air Force "graduate level" courses for mishap investigators and board presidents. From 14-18 November 1983, MAC conducted the second Advanced Safety Investigation Course for 33 flight safety officers (FSOs), and the second Advanced Safety Investigation Board Presidents' Course for 10 senior MAC officers.

Our experience indicates that the success or failure of a mishap investigation depends heavily on the leadership and investigative expertise of the investigating officers. With that in mind, the courses were designed to emphasize advanced investigative techniques and MAC-unique procedures, as well as answer the always-present questions of what happened, why, and what can we do to prevent recurrence. To that end, the courses expand on the basics taught at Norton AFB, California, by the Air Force Inspection and Safety Center (AFISC).

**Board Presidents' Course**

The Board Presidents' Course included an abbreviated, day-and-a-half version of the Norton course, taught by Col. Lou Busch (AFISC). The course introduced the senior officers to the ominous task which might confront them one day. The remainder of the week included presentations by the MAC flight safety and judge advocate staffs, the Armed Forces Institute of Pathology (AFIP), and an aircraft manufacturer's representative. Maj. Gen. Donald Brown and Brig. Gen.

Larry Wright, MAC Deputy Chiefs of Staff for Operations and Logistics, respectively, presented executive views on mishap investigations and insight into problems they've seen in past formal mishap reports and briefings. Maj. Mike Fagan, Electronic Systems Division's chief of safety and a highly experienced investigator, briefed board member responsibilities and the need for technical assistance during the investigation.

Other subjects covered during the course included preparation of the formal report, the CINCMAC briefing, and the command review process. On the last day, three former board presidents met with course participants in a seminar and discussed experiences not specifically covered by mishap investigative directives. They also explained techniques they used during their investigations.

**Advanced Investigators Course**

Unlike the senior officers who attended the Advanced Board Presidents' Course, all of the FSOs had completed the basic course at Norton. In fact, some had already been on mishap investigation boards. All of the topics covered in the Advanced Investigation Course were presented by guest instructors representing the USAF School of Aerospace Medicine, AFIP, Air Force Logistics Command, an aircraft manufacturer, AFISC and the National Transportation Safety Board.

According to the critiques, the students were enthusiastic about the course contents and the presentations. Additional benefits were the face-to-face exchanges between the MAC safety folks and experts who assist in mishap investigations.

The advanced techniques provided in the courses will enhance MAC's ability to keep the command the safest in the Air Force and the world. The last hope is that these highly-trained investigators will never have to use their newly-found knowledge.

*Editor's Note:* It is our command goal that we will never require the services of our board presidents and investigators. Unfortunately, the knowledge gained from these courses was put to use all too quickly. No sooner had the courses ended than two graduates, a senior officer and an investigating FSO, were selected to investigate a Class-A mishap.

**Seated, left to right: Capt. Daniel J. Beatty, Jr.; Capt. Steven N. Baumgartner; Capt. John Haaf; Capt. Jay Bagley; Capt. Donald Thomas; Maj. Jim Albritton, Capt. Tom Prodanovich. Second row: Maj. Ernst Motz; Maj. Michael G. Luckenbach; Capt. Jeffrey S. Alderfer; Capt. Jose R. Agosto; Capt. Dale W. Van De Ven; Maj. Richard H. Lettan; Capt. Stephen E. Behr; Mr. E. T. Epps. Third row: Maj. Chet Cartwright; Capt. Sandy Richardson; Capt. Fred Dudney; Maj. Mike May; Capt. Lonnie Adkins; Capt. Russ Urdahl; Lt.Col. Roger Riggs; Lt.Col. Ben E. Josey; Capt. Robert E. Rakitis; Maj. Arthur Brownell. Fourth row: Maj. Jack Heffernan; Capt. John Ufford; Capt. Larry E. Fenley; Capt. Mike Jackson; Maj. Ralph Wright; Capt. Mark Tucker; Capt. Mark Fowler; Capt. Lawrence Pohl.**

# Allied Airlifters

## Arava 202

Looking very much like an egg with wings, the Israeli Aircraft Industries (IAI) Arava was designed to fulfill the need for a light STOL transport with rough-field capabilities. The military transport first flew in 1972, some three years after the first flight of the civil version. There are two military derivatives of the Arava. The IAI 201 can fly a number of varied missions including maritime surveillance, electronic intelligence gathering and

gunship. In the gunship role, the Arava carries two .50 caliber machine guns, one on either side of the fuselage, six 82mm rockets and has provisions for an aft-firing machine gun.

A further refinement of the IAI 201 is the 202. It differs principally in having a fully wet wing with wing-tip winglets and a boundary layer fence just inboard of each wing tip. The 202 is powered by two PTA6A-36 turboprops rated at 750 shp, and also has a single-point refueling system.

The IAI 202 can carry 30 fully-equipped troops or 20 paratroops, and a crew of one or two on the flight deck. With full fuel, the Arava 202 has a range of 870 nm, or with a full payload (5,184 lbs), 340 nm. It can take off in as little as 960 feet, land in just over 800 feet and cruise at 172 knots at 10,000 feet.

Built in Israel, the Arava is exported to many countries in Central and South America including Mexico, Honduras, Ecuador, Argentina, Bolivia, and Colombia. The Arava is also flown in this country by several commuter airlines.

**Dimensions:**

Wing span — 68 ft 9 in
Length (pod) — 33 ft 7 in
Height — 17 ft 1 in
Max takeoff and landing weight—15,000 lbs.

# 8-Ball in the Corner Pocket

## Was it just bad luck that doomed "the 8-ball"?

by TSgt. Bruce Hanke
143 TAG (R.I.A.N.G.)
Quonset State Airport
North Kingstown, Rhode Island

Anyone could have called the shot—the signs were all there. The characters are a different story. Their names are fictitious, but we all know them for they are composites of people all around us. We may be hurt or may die because of their actions or, more correctly, their lack of action. Yes, we all know them.

-The maintenance technician who thinks "it's close enough for government work."

-The maintenance technician who repeatedly fails to properly eliminate malfunctions.

-The supervisor who fails to identify and correct his subordinate's poor job performance.

-The pilot who doesn't think alcohol will affect his ability to fly.

-The complacent or overconfident crewmember.

-The crewmember or maintenance technician whose other interests compromise proper job performance.

-The crewmember who panics in a stressful situation or one who looks the other way when an associate handles such a situation unprofessionally.

Yes, we all know them. We might even be one of them.

"I've got an uneasy feeling deep down inside, but I can't quite nail it down," grumbled TSgt. "Snake" McManus to his roommate TSgt. Dave Garrity. It was a muggy, sunny morning and the Air National Guard troops in Panama were preparing to rotate home after two weeks of Volant Oak duty.

A year-round rotation keeps Guard and Reserve C-130 aircraft available for duty in Latin America and this just seemed to be another ordinary day in another ordinary rotation. Yet, was it "just another ordinary day?" In a way it was.

It was Saturday morning, July 29th, and the aircrews and maintenance people had partied until midnight. After all, it had been a tough two weeks, the weather had been steamy hot, the aircraft hadn't been up to snuff, and time off had been limited due to mission requirements and maintenance problems. We deserved that blast, thought Snake. He had been in the Air Guard for 12 years, 11 of them as a full-time technician, and before that had served a hitch in the regulars. He was responsible for seeing the autopilot system was always kept in good working order, and he always made a point of saying "everything's gotta be first class all the way," as he went that extra step above and beyond. So it was no surprise he felt a bit disturbed about having to fly back home on "Triple Eight."

C-130A, serial number 888—"the Eight Ball" as the Herk was called by the troops who maintained it—had always had more than

**Honorable Mention, 1983 MAC Flying Safety Writing Contest**

its share of problems. But after a couple of years of TLC, 888 was finally beginning to shape up, except for that troublesome autopilot. Triple Eight had been having autopilot rudder problems off and on for over a year and SSgt. Moroni had not been able to come up with a proper fix. McManus had assigned Moroni to the job each time the aircraft came back with the rudder writeup, but Moroni could never duplicate it on the ground and could find nothing out of the ordinary during troubleshooting and bench checks.

But 888 hadn't been fixed and was on the Volant Oak schedule only because of a last minute breakdown of 882. Even so, preparing 888 was a last-minute rushed affair which required hurriedly installing the leading edges, and running engines at the last minute. On the flight down, the rudder oscillations were mild and slightly annoying, but tolerable.

The workload for the two weeks had been fairly intense, but all things considered, the tour had gone smoothly. It was customary among Volant Oak participants to have a steak fry on the day before departure. The maintenance and ops people usually got together and did everything up in style and this trip was no exception.

The aircraft commander, Maj. Larry Dukovic, an Air Guard pilot for the past 20 years, had flown six different fighter and transport aircraft. He flew full-time for Northern Airways, Ltd., had flown for various other airlines during his career, and generally knew the flying business exceptionally well. He was a bit overconfident at times, though. He often demanded his own way, and perhaps thought a bit more of himself than he should have. He was also known to become somewhat edgy and flustered during demanding situations in flight, but no one ever said anything to him about it, nor was much really thought of his occasional bending of the rules.

Customs proceeded smoothly and the crew loaded the passengers and baggage aboard Triple Eight. But smoothly or not, Snake just couldn't help feeling that in some way the autopilot and that uneasy feeling he felt earlier that morning were linked. Moroni seems to know his stuff, thought Snake, but I don't think he's given this his all in the "effort" department.

Sergeant Bill Moroni hadn't come on this trip. In fact, he hadn't participated as much as everyone else in unit deployments and it seemed his attitude toward his work had deteriorated in the past few months. He had other interests and aircraft maintenance had taken a back seat. Snake had noticed this, reprimanded him several times for poor work, but had never taken any serious steps to really correct the problem. Sergeant McManus had hoped the problem would clear itself up or just plain go away. When we get back, I'm going to work on getting Moroni's performance up to snuff, noted Snake privately as he buckled himself in. Either that or I'll get someone who can handle the job, he added thoughtfully as triple eight's engines came to life.

"Bravo 99, cleared for departure," crackled the voice through Dukovic's headset. Departure was smooth and uneventful as Bravo 99 climbed to altitude. Twenty-seven minutes into the flight, Dukovic leveled off at cruise altitude, trimmed the aircraft, and engaged the autopilot.

"The airplane's yours, Sammy," directed the AC to his copilot, Capt. Dirk Samuels. Dukovic then leaned back and attempted to catch up on some badly needed shut-eye.

Dirk Samuels, a Guardsman for six years, had gone on as many deployments as possible, and was considered by his associates to be a decent flyer. He felt the experience and exposure to worldwide deployments would be to his advantage someday.

"Keep an eye on things, Tony," Samuels halfheartedly said to the flight engineer, MSgt. Anthony Manero.

"Uh-huh," mumbled Manero, groping for his box lunch. This is the boring part of the trip, he thought. Peeling open a chocolate bar, he put the lunch down and reached for a dogeared paperback stuffed in his green bag. Tony had been a flight engineer for seven years and prior to that an aircraft mechanic for eight years, almost all on the C-130. He knew the Herk inside out. It was routine to him—not boring, just routine. After quickly scanning the instruments, he flipped the book open.

An hour and a half into the flight, Snake felt a violent yaw rapidly followed by another. Uh-oh, he thought, there goes that blasted autopilot again. The loadmaster on

**As the leading edge separated... it slashed the number 4 fuel tank wide open.**

the forward cord motioned to Snake.

"The major wants to see you," shouted the load over the din of the engines. McManus climbed the steps to the flight deck and plugged his headset into the spare interphone jack. Dukovic turned toward Snake.

"That yaw woke me up, McManus. I gotta have my beauty rest and we need this autopilot. It's a long haul back, y'know!"

**ABOUT THE AUTHOR**

TSgt. Bruce Hanke entered the Air Force in 1967 and received his technical training as an Avionics Instrument Systems Specialist. Following tours at Tuy Hoa, Vietnam and Clark AB, Philippines, Sergeant Hanke returned to McGuire AFB, New Jersey. He joined the Rhode Island Air National Guard in 1973 where he's maintained C-119s, U-10s and now C-130As. Sergeant Hanke received an AAS degree in Electronics from Rhode Island Junior College, and is now working on a bachelors degree from the University of Rhode Island.

"Yessir, I'll see what I can do. First, could you disengage the rudder servo so I can try something."

The AC moved the rudder switch to the "disengage" position as Snake went back to the radio rack and disconnected the autopilot output connector from the compass amplifier.

"OK Major, try the rudder now," said Snake hopefully, returning to the flight deck. Dukovic reengaged the rudder servo and noted no oscillations in the rudder axis at all.

"Let's try that for awhile," mumbled Snake.

"Sounds good to me," added Dukovic.

"There's only one problem with this," noted Snake hastily. "Now the autopilot won't follow a compass heading because I've removed the heading reference from the system. You'll have to make sure we don't drift off course."

"OK, no problem," declared the AC, not fully comprehending what Snake had told him. Dukovic scanned the horizon and his instruments quickly, noted that all appeared well and settled back with his somewhat cloudy cranium still throbbing.

Half an hour later, Samuels was still browsing through a magazine, and Manero remained engrossed in his novel. The navigator, meanwhile, was engaged in plotting the next leg of the journey. Perhaps not surprisingly, no one noticed the Herk drift gradually to the left of course with a very slight, unperceived descent. The Eight Ball swung itself slowly around in a wide, graceful arc. Just about the time the compass needle passed the 230 degree mark, Dukovic realized the predicament of his aircraft.

"Oh no!" shrieked the AC into his mike. "We're off course and losing altitude!" Dukovic panicked. He yanked the controls hard right, slamming everyone and everything not strapped in or tied down against the fuselage and against stanchions and racks. A weakened and improperly installed right wing outboard leading edge section then suddenly ripped loose from its piano hinge mounting, tearing wires, tubing and bleed air ducting out with it. As the leading edge separated from the aircraft, it slashed the number 4 fuel tank wide open. Fuel from the mortally wounded Eight Ball gushed into the now turbulent slipstream as the Herk rolled over and erupted into a ball of flame.

# TMF Instrument Quiz

## Test your intrument knowledge!

You have diverted to Manchester Airport-Grenier Industrial Airpark in Manchester, New Hampshire. Study the approach plate provided and answer the following questions—if you can.

1. The Manchester airport elevation is:

   a. 434 feet.
   b. 234 feet.
   c. Depends on the altimeter setting.
   d. Not given.

2. Approaching Manchester from the northwest, the minimum safe altitude sector altitude of _____ will provide _____ of obstruction clearance within _____ of _____.

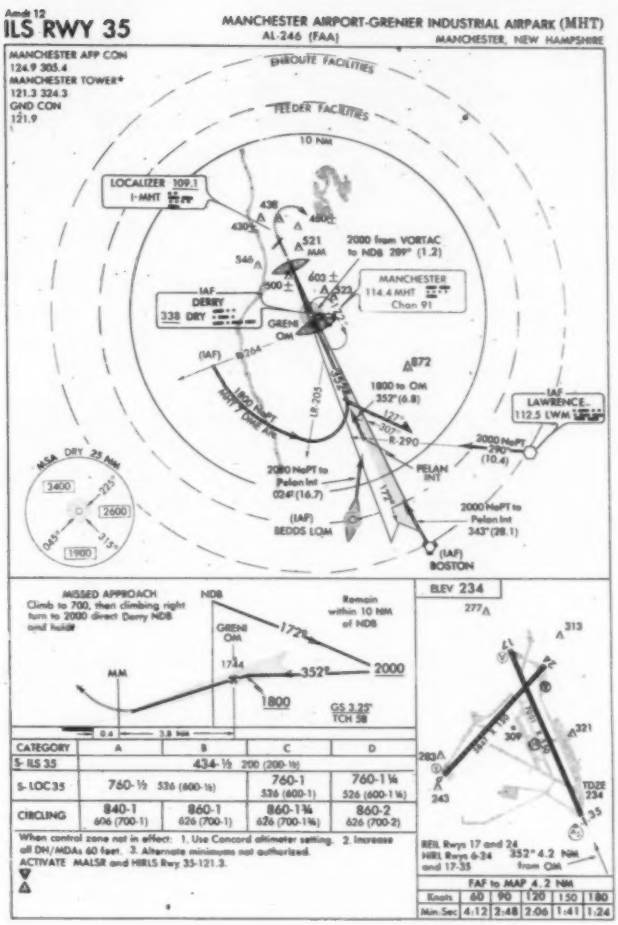
   a. 2,600 feet, 1,000 feet, 100 nm, MHT VORTAC.
   b. 3,400 feet, 500 feet, 25 nm, the field.
   c. 3,400 feet, 1,000 feet, 25 nm, the field.
   d. 1,900 feet, 1,000 feet, 25 nm, MHT VORTAC.
   e. 3,400 feet, 1,000 feet, 25 nm, DRY NDB.

3. DME is required for this instrument approach procedure (IAP)?

   a. True.
   b. False.

4. There are _____ different initial approach fixes (IAF) depicted in the planview of this IAP?

   a. three
   b. four
   c. five
   d. an indefinite number of




5. The control zone is not in effect. What is the decision height for the straight-in ILS approach to runway 35 (Category C)?

   a. 434 feet.
   b. 860 feet.
   c. 494 feet.
   d. 920 feet.

Use the following information for questions 6-9. You are now five miles north of MHT VORTAC, inbound on the 360° radial and cleared for the ILS runway 35 approach via DRY NDB. The ILS is fully operational,

as is the corresponding equipment in your aircraft. Your last assigned altitude is 3,400 feet.

6. You may descend below 3,400 feet when:

a. You pass MHT VORTAC.
b. You are established on the MHT VORTAC 172° radial outbound.
c. You are established on the MHT VORTAC 352° radial inbound.
d. You are outbound abeam DRY NDB.

7. You should execute the procedure turn so as to:

a. Intercept the localizer prior to DRY NDB.
b. Stay within 10 nm of MHT VORTAC.
c. Intercept the localizer within 10 nm of MHT VORTAC.
d. Remain within 10 nm of DRY NDB.

8. You may descend to 1,800 feet when:

a. Beginning the turn to intercept the DRY NDB 352° bearing inbound.
b. Established on the MHT VORTAC 352° radial inbound.
c. Within 10 nm of DRY NDB with an intercept to the DRY 352° bearing.
d. Established on the localizer inbound.

9. You may descend below 1,800 feet when:

a. Passing GRENI outer marker.
b. Established on the localizer course.
c. Intercepting the ILS glide slope.
d. None of the above.

10. If your planned maneuvering airspeed is 150 knots, the appropriate circling approach minimums are:

a. 840 feet—1 mile.
b. 860 feet—1 mile.
c. 869 feet—1 3/4 miles.
d. 860 feet—2 miles.

11. The missed approach holding pattern at DRY NDB is non-standard.

a. True.
b. False.

12. You are flying the localizer-only approach to runway 35 at 120 knots. You should execute the published missed approach (field not in sight) when:

a. Passing the middle marker.
b. 4.2 nm from the MHT VORTAC.
c. 2 minutes and 6 seconds past GRENI (assume no wind).
d. Reaching minimums.

Answers to *TMF* Instrument Quiz.

1. b. The airport elevation of 234 feet is found in the upper right hand corner of the airport diagram at the bottom of the approach plate.

2. e. The published sector altitudes, based on the DRY NDB provide 1,000 feet of obstruction clearance within 25 nm of the facility.

3. b. DME is not a requirement.

4. c. The sharp-eyed *TMF* editors could find only five IAFs.

5. c. See note 2 at the bottom left of the approach plate.

6. d. You may descend from the procedure turn fix altitude (published or assigned) when outbound abeam the procedure turn fix.

7. d. Look at the note in the upper right hand corner of the cross section depiction of the approach.

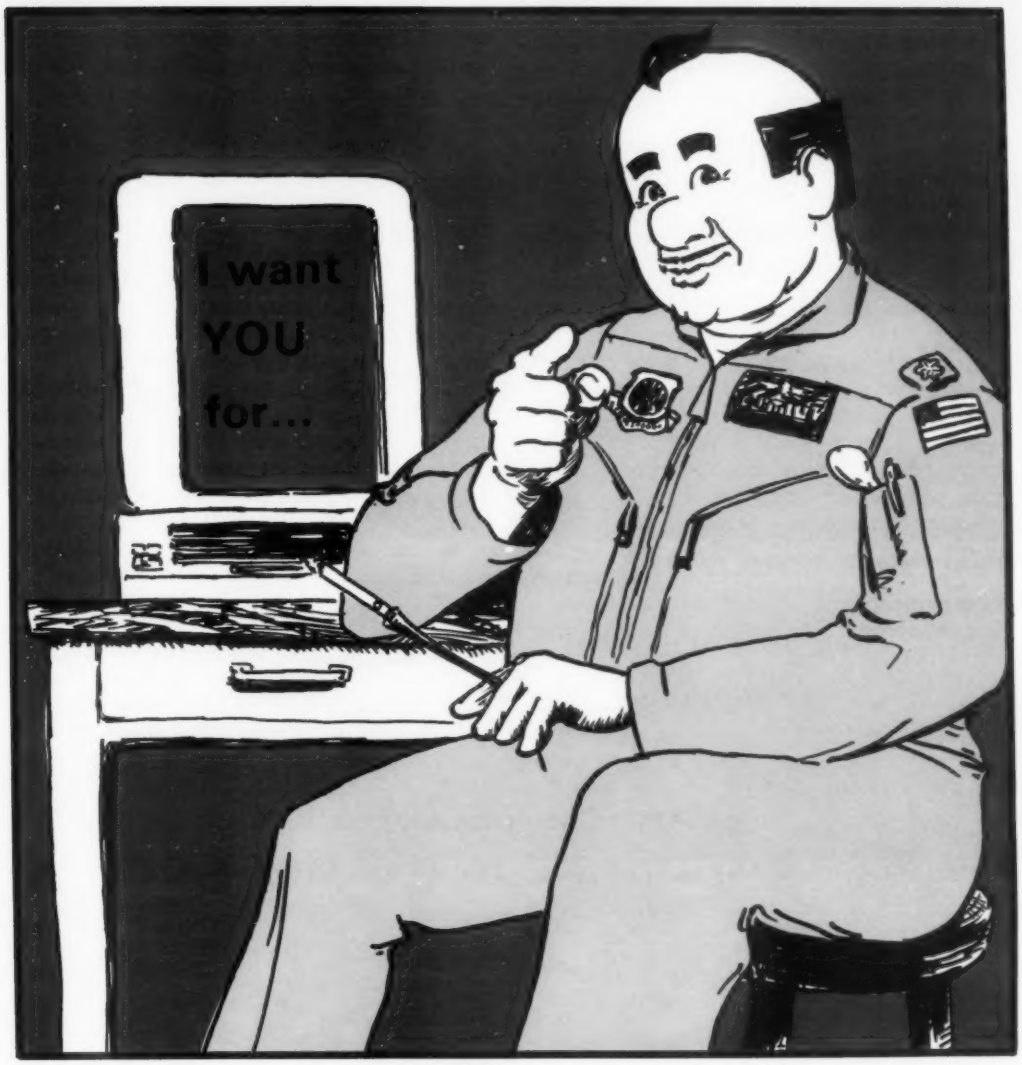
8. d. You can't descend until you are established on-course inbound.

9. e. The 1800 depicted on the cross section view of the approach indicates this is a glide slope intercept altitude.

10. d. At 150 knots you are a Category D aircraft.

11. b. A standard holding pattern has right-hand turns.

12. e. The only way to determine the missed approach point on this approach is timing.




# THE MAC Flyer

**MILITARY EDITOR VACANCIES FOR *The MAC Flyer***—We have an immediate opening and an opening in May-June 1984 for Associate Editors of MAC's flight safety journal. We need company grade pilots or navigators with MAC flying experience. Ambition and ability to tell a good story are strong qualifications for these positions. Flight safety and/or public affairs experience a plus. Interested officers should contact Major Jim Lee, Supervising Editor, Autovon 638-3534, or write to HQ MAC/IGFE, Scott AFB, IL 62225.

# Frankfurt-Main International Airport, Federal Republic of Germany

## (elevation: 365 feet)

At 3 miles, runway 25L is clearly visible.

At 1 mile final, runway 25L. Military ramp is to the left.

A go-around 07R presents little hazard.

Just 2 miles south of Frankfurt, the Frankfurt Main Airport and Rhein-Main AB are situated in a densely populated river valley. Nearby military alternates include Ramstein AB, 54 miles southwest, and Hahn AB, 50 miles west.

As MAC aviators can readily attest, flying into Frankfurt demands extensive knowledge of German ATC procedures and your best flying. You should anticipate high density traffic on both your approach and departure. MAC crews must also know and be prepared to follow buffer zone procedures while flying into Frankfurt. Speed control and holding may be in effect for any or all approaches. Arrivals and departures at Frankfurt require special noise abatement procedures as outlined in FLIP Area Planning 2.

A combined civilian and military facility, Frankfurt has two parallel runways, 07/25 L/R. Runway 18, scheduled for completion in April 1984, will feature departures to the south only. You'll probably be most concerned with runway 07R/25L, closest to the Rhein-Main military ramp. This precision runway is 12,303 feet long and 148 feet wide.

Approaches into Frankfurt include VOR/DME, ILS, NDB/DME, ASR and circling. Watch for narrow taxiways and crowded ramps on the military side. Fog, low ceilings, and rapidly moving fronts frequently combine with heavy air traffic to keep things interesting, so be prepared!

—Adapted from AQP 38526

# C.R. TERROR

**The Starlifter Sultan scrapes his belly!**

Dreams, Sammy m'lad. They're the basis of our whole civilization," commented the Ace of Aerospace, lighting up a gold-ring Egyptian Oval and reclining back in the Starlifter's left seat. "*Nothing* is hopeless."

"Sure, Boss, sure," mumbled a startled Sammy who hadn't the slightest idea what C.R.'s feeble faculties had dreamed up on this oceanic crossing to Europe.

"Of course, location is important. And job responsibility suitable for a senior officer. And assignment equity—everyone must simply have the same opportunity," the Starlifter Sultan continued rambling.

Max Torque, the flight engineer, initially thought C.R. had invented a new cockpit game called "Incoherence," and so added, "You're exactly right, Boss. But speaking of location, how's the weather at our destination, good ol' Hanskirchen Air Base?"

"Not to worry, Max. Sammy, how 'bout you get the weather," directed C.R. dropping cigarette ashes into his copilot's custom—engraved, alabaster coffee mug and alternate beer stein.

"Glad to oblige, Boss. But let's get back to your rav... er, what you were saying about dreams, location, and assignment equity? Are you, by any chance, moving?" questioned the now wide-awake Sammy, at once reevaluating his suddenly-improved chances for promotion to major with a new AC.

Ty Downs, the loadmaster, listening in on the interphone and getting pleasantly excited, added, "Moving, Boss? Are you moving? Did someone men-

tion that we might lose the legendary flying skills of MAC's most senior field grade officer? Does this mean the breakup of our crew?"

MAC's first, last, and only integral crew, so quickly aroused to grandiose visions of a future without the Marginally-Magnificent Major suddenly had their hopes and dreams destroyed.

His mind, as usual out of sync with his body, C.R. randomly scattered his pubs kit over the cockpit center console, knocked the aircraft off autopilot, and then explained, "Rest easy, m'lads. No, your fearless leader isn't moving. On the contrary, my famous flying exploits are sure to make a positive impact on the forthcoming lieutenant colonels' board, especially when coupled with my new squadron additional duty as pilot non-scheduling officer in an unspecified operating location known as the Terrorific memorial stall. Why the squadron commander himself picked me for the job. Although he hasn't briefed me fully on my new promotable position yet, he's explained that I'll be responsible for comprehensively non-scheduling myself for future flying sorties. So I'm sure I'll be involved in the squadron operations more than ever before. No, the senior officer who's moving isn't yours truly. It's our own wing DO, Col. Frank N. Fang, who has orders for somewhere in Germany. In fact, he left last week, although I managed to miss...er, I mean, was prevented by non-squadron duties from attending his

going-away party at the club."

"Speaking of parties, Boss, are we going to have a crew party when we land at Hanskirchen?" questioned the right seater.

"Right you are, Sammy. Though I would never speak ill of the recently departed, let's have our own Farewell Fang gathering with the honoree in absentia." C.R. gleefully gulped his Pang citrus fruit drink and smiled, not noticing that the orange-colored refreshment was also flowing over the front of his custom-designed Nomex flight suit. "Any improvement in weather at Hanskirchen, Sammy?"

"Not exactly, Boss. Metro says the ceiling and vis are still barely above minimums but the whole area is going down fast. Hahnstein, Bitsdorf, Zeppelinfurt, and Stutthoff airports all have sky obscured and RVRs less than 1400 meters. Could be time to divert to the U.K.!" Sammy politely hinted.

C.R., with visions of capturing the not-so-exclusive U.K. cafeteria franchise for Kentucky Baked combination fish 'n' chips and frog legs served with a side order of garlic grits and redeye gravy, suddenly beamed, "Why landing at Mulchenhill would be perfect! It's just the spot to introduce my Southern-style fast-food cuisine that's sure to be the rage in Europe this summer, or so my Zurich banker tells me. It might be in my economic...er, I mean, in the interest of flying safety to undertake such a prudent precautionary diversion. But let's try one approach into Hanskirchen anyway, m'lads."

C.R. impatiently grabbed the radios. "Munchken Control, this is Air Evac 174 requesting the ILS to Hanskirchen, immediate descent to FL 080 and direct Geilenwurst."

"Roger, Air Evac 174, you're cleared direct," replied the polite but somewhat surprised Munchken radar controller. "But we show you as a MAC call sign. Please confirm."

"Sorry Munchken, someone always fails to get the word," C.R. bluffed, having perfected the "changing call sign" ruse on past missions.

"Hey Boss, are we carrying patients?" the hard working but ill-informed Ty Downs interrupted. "Should I give a patient briefing or put everyone on oxygen or some-

thing? Is this a drill?"

C.R. merely scowled and snarled, "No, load. Please take your seat and strap yourself in- *permanently*. I'll brief you later."

Minutes later, C.R. slowed the Starlifter and intercepted the ILS glide slope over the moonless cloud deck. "No sweat, Sammy. I was weaned on flying precision approaches in steady rain, fog, and completely obscured skies. Builds character, m'lad. I'm sure they said the weather was above minimums but I can't see the field yet. By the way, did I tell you about my latest approach into Lajes in bad weather?"

"Later, Boss. Later," a worried Sammy pleaded as he called out minimums.

"Gadzooks, we're much too high to see the ground. Better take a peek under this haze to spot the ol' runway," C.R. quipped as he nonchalantly eased the Starlifter to a 3.5° approach angle. "Thar' she blows, I've got the approach lights in view."

"Could you bring it back up, Boss?" a now insistent Sammy's voice raised an octave.

"Nonsense, m'lad. I was flying approaches like this long before you pinned on your lieutenant bars," C.R. dismissed his right seater's comments. "I'm going visual. Dive! Dive! Dive!" C.R. yelled gleefully, simultaneously chopping power and aiming for the threshold.

"Red over red!" screamed Sammy as the GPWS began it's "pull up, whoop, whoop, pull up" siren song.

With the ground suddenly rushing up, C.R. firewalled the throttles, yanked back on the yoke and the Starlifter began to climb, but not without a brief and sickening scrape and screech in the Starlifter's now injured belly.

"I've got it, Boss!" Sammy insisted as he overcame C.R.'s death-grip on the yoke and eased the C-141 onto the runway.

Minutes later, as the crew taxied into parking, they were not so amazed to see a blue Air Force staff car drive up. They *were* amazed, on the other hand, to see a colonel leap out of the car, rush to the rear of the C-141 and grab what seemed to be mud-covered tree branches from the scratched and scraped belly of the wounded Starlifter.

The Magic Major's face suddenly paled as he now recognized and hastily saluted the blue-suited colonel. "Well, what a coincidence meeting you here, Colonel Fang. I didn't know you had been assigned to Hanskirchen."

Colonel Fang, red-faced and looking like an explosion waiting to happen, smiled menacingly as he ordered the Belly-Scraping Buffoon out of the cockpit. "You've made your last flight in MAC, Terror! You're going to be Q-3 permanently!" yelled the colonel, beginning to cackle hysterically.

"You can't be serious, Colonel Fang," C.R. moaned dejectedly.

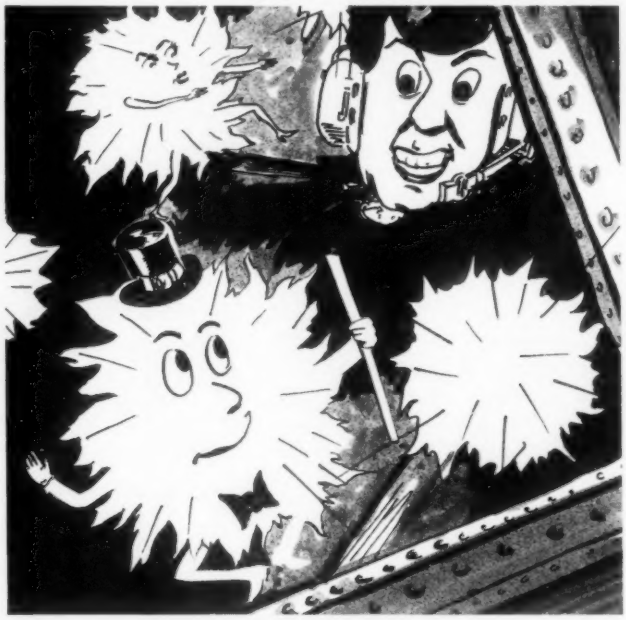
But he was. ✭

# Quick Stoppers

## St. Elmo Revisited

A B-52 had just returned from a routine training mission and the crew was practicing multiple instrument approaches and landings in the local pattern when they experienced electrostatic discharges—twice. Both incidents happened on base leg and were preceeded by static on the UHF radio. The second discharge also had the added phenomenon of St. Elmo's fire on the windscreen. Postflight inspection revealed damage to antennas and navigation lights on both wingtips.

What was the weather at the time of this double zap? How about a 300 foot overcast ceiling with rain, snow and fog; temperature 35° and dew point 31°? All in all, a perfect setup for electrostatic discharge and conditions most or all MAC fliers will encounter sometime this winter.



## Cargo Compartment Deicing

On climbout from a European base, the Galaxy loadmaster conducted a normal cargo compartment walkaround. The loadmaster discovered an on-board deicing truck (part of the cargo) still hard at work, however. It was dispensing deicing fluid to the cargo floor, courtesy of a leaking deicing line beneath the truck. Following cleanup, the Galaxy landed without incident at the next scheduled stop.

Shipping documents for the truck were in order, with one exception—there was *no* mention of deicing fluid in the truck's tank. The deicing truck is continuing its hard work at a new base, but this time supplying deicing fluid to aircraft exteriors only!

## Starlifter Belly Buster

The Starlifter crew flew a stable approach to a strange field (at night, of course) but made a firm landing. After tower reported a flash of light from the right side of the aircraft during the landing, the AC ordered an exterior inspection by the flight engineer and transient maintenance personnel. The inspection revealed nothing unusual so the reported flash was dismissed as compressor stalls experienced during the application of reverse thrust. The next day the aircraft returned to home base where the crew wrote up the firm landing and debriefed maintenance concerning the incident.

The homedrome maintenance folks performed a hard landing checklist that night and noted no damage. They later stated they used light carts, but concentrated on the main gear area during their inspection.

During the preflight for the next mission, maintenance noticed damage to the aircraft's skid plate, but placed the writeup on a diagonal and cleared the aircraft for flight. Following a flight to an overseas location, the flight engineer discovered damage in front of the skid plate and entered that information in the forms. Again, though, the aircraft was cleared to continue the mission.

Finally, after some 8 days and 15 sorties flown by 7 different crews, the aircraft returned to home station and maintenance *thoroughly* inspected the damage. The end result of this *minor* belly scrape episode was frightening. The ramp forward centerline brace, skid strip assembly, belly band, fuselage skin panel and centerline tube bracing were all damaged beyond repair.

In defense of the maintenance folks and assorted flight crews who inspected and preflighted the aircraft, the damaged area was extremely difficult to see. In fact, the *only* way to see it was to get on one's hands and knees. If you suspect a belly scrape, make *sure* a qualified individual actually gets under the aircraft and takes a good look.

## Fickle Fuel Control

A CT-39 crew recently had a problem determining who was in control of their aircraft. No, it wasn't a pilot/copilot battle, rather a faulty number 2 fuel control.

The takeoff and climb had gone smoothly, with only a slight engine surge noted. But after level off, the number 2 engine went to 100 percent without throttle input. The pilots quickly retarded the number 2 engine to idle, but the engine continued to operate at 100 percent. After confirming the engine was, in fact, operating at military power, the crew shut it down during the descent and made an uneventful landing.

## Quick Stoppers

### *Directional Miscontrol*

A commercial Boeing 747 recently experienced a most exciting takeoff roll. It seems the copilot was making the takeoff and considerably exceeded the computed EPR on initial power application. As the flight engineer adjusted the throttles to achieve the proper EPR, an asymmetric power situation developed and the aircraft began to drift towards the right of the runway. The copilot attempted to correct using nosewheel steering, but the light weight of the jumbo jet rendered it ineffective. Luckily, the rudder soon became effective thanks to increased airspeed, and the 747 returned to centerline and completed the takeoff without further incident.

Following the takeoff, airport officials discovered a 3,000 foot nosewheel skid mark which started at the runway centerline and veered to within 34 feet of the grass before once again returning to the centerline. Additionally, two VASI lights were blown over by the jet blast.

An investigation revealed the captain had considered aborting the takeoff, but didn't because the aircraft was returning to centerline. The skid mark was caused by *full* left nosewheel steering being maintained until 106 knots.

If faced with a similar situation, remember the sage advice that it is far better to reject and try again than to take an unplanned and unwanted excursion through the weeds.

—Adapted from *Air Safety Review*

## Notable Quote

Seven steps to safety stagnation—

- It won't work.
- It costs too much.
- We're doing okay without it.
- We're not ready for that yet.
- We tried it once and it won't work.
- We've never done it that way before.
- That's not my responsibility.

—RAF *Ostrich*

# After Deadlines

**NEW COMPUTER LOAD PLAN SYSTEM**—MAC is now acquiring a computerized load plan system primarily for use at non-MAC stations. Dubbed the Deployable Mobility Execution System (DMES), this system will reduce the time it takes to load plan while also dramatically increasing the accuracy of the plans. DMES consists of a deployable microcomputer and software developed by the Air Force Logistics Management Center at Gunter AFS, Alabama. Tested in various exercises and recently in URGENT FURY, DMES consistently reduced load planning times up to 95 percent. DMES is now authorized for operational unit moves and for missions other than MAC channel missions. For more information on DMES, contact Lt. Col. Rochelle at HQ MAC/DOCS, Avn 638-3570.

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**DEPENDENT STUDENTS ALLOWED ONE FREE ANNUAL TRIP**—Military dependents attending school in the United States while their parents are stationed overseas are now entitled to one free trip a year to visit their parents. Unmarried dependents, under 23 years old and attending a secondary school or pursuing undergraduate college education in the CONUS, Alaska, or Hawaii are eligible for the round trip. The free trip is authorized for students attending secondary schools in the CONUS when a DOD school isn't available overseas. Commercial transoceanic transportation costs will not be reimbursed if space-required MAC transportation is available. In addition, using a foreign carrier when U.S. air carrier service is available will result in transportation costs not being reimbursed. (MNS)

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**DECREASING SUN SPOTS MAY DEGRADE HF RECEPTION**—After five years of fairly heavy solar activity, sun spots are on the wane and will continue to weaken for the next four or five years. That means HF radio communications will probably be degraded. Sun spots shower radiation throughout the solar system and contribute to the ionization in the earth's upper atmospheric layers known as F1 and F2. These layers, in turn, provide the "surface" against which HF transmissions are reflected back to the ground. Low sun spot activity decreases F1 and F2 ionization level, allowing more HF energy to escape into outer space. HF transmissions in the 11 to 18 MHz band pass through these layers most easily and are most likely to be weak or fade during periods of low ionization. To help get your HF signals through, try using the 2, 5, 8 and 11 MHz bands which reflect off the weakened F layers better.

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**DANGEROUS MICROBURST**—On 1 August 1983, a microburst with horizontal winds exceeding 130 knots slammed into Andrews AFB, Maryland. Associated with a severe eastward-moving thunderstorm (42,000-foot top), strong winds uprooted trees and tore large sections of roof off several buildings. Total duration of the microburst was nine minutes. Microbursts are deadly and can happen during any season. Remember, if there is any doubt about the presence of a microburst, delay your takeoff, hold, or if you're already on the approach, take it around! For more information on this deadly phenomenon, see "Blueprint for Disaster," October 1983 *TMF*.

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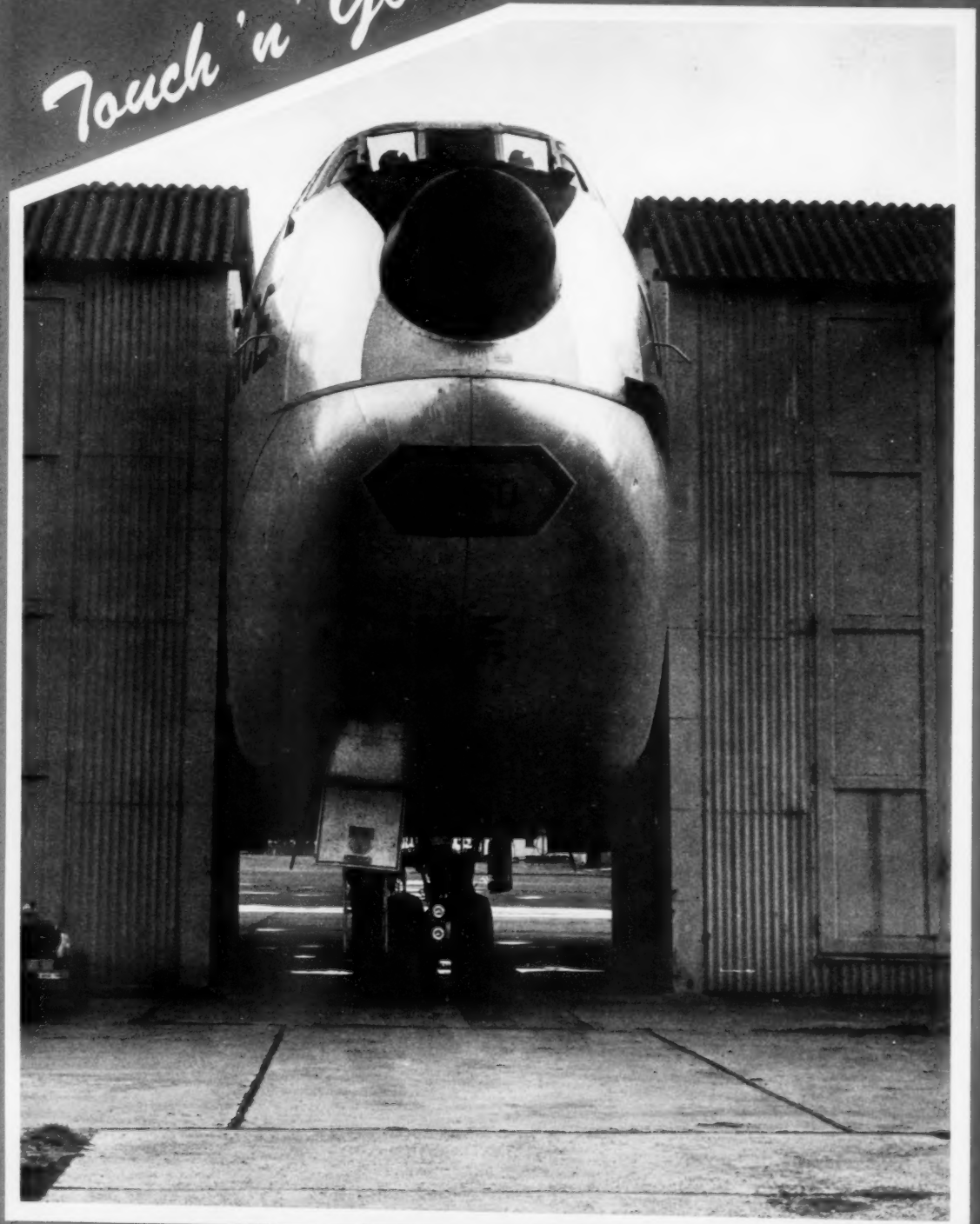
# Touch 'n' Go



"I've heard of chocks, but this is ridiculous!"